

AMENDMENTS

IN THE FORMAL DRAWINGS:

The Draftsperson objected to the drawings submitted on November 22, 1999 under 37 C.F.R. §§ 1.84(g)(i) and (p) as stated in the Office Action mailed March 28, 2002 and June 3, 2002. Specifically, the margins are not acceptable for Figures 3C, 7 and 8 and Figures 2, 3A-3D contain poor line quality and/or legends are poor. Therefore, Applicants submit a corrected copy of the drawings to overcome this objection for Draftsman's and Examiner's review and approval. No new matter has been added to the drawing.

IN THE CLAIMS:

For the convenience of the Examiner, all pending claims of the present application are shown below in clean form whether or not an amendment has been made. Please refer to the attached sheet showing a mark-up version of the amendments to the claims.

Claims 1-20 were previously cancelled without prejudice or disclaimer.

21. A method for identifying a marker that correlates with the intensity of a pain perceived by a patient comprising the steps of:

collecting a serum sample from the patient;
separating the components within said serum sample by electrophoresis in a gel;
reacting the gel with a diazonium salt and a substrate for a period of time to form a detectable band comprising an insoluble diazonium complex; and
identifying the size and location of the detectable band to identify said marker.

22. The method of claim 21 wherein the gel has a gradient polymer density.

23. The method of claim 21 wherein the diazonium salt is 4-chloro-2-methylaniline.

24. The method of claim 21 wherein reacting is terminated by adding a reagent to the gel wherein said reagent is selected from the group consisting of acetic acid, formic acid and citric acid and mixtures thereof.

25. The method of claim 21 further comprising performing densitometry analysis on said gel.

Claims 26-55 were previously cancelled without prejudice or disclaimer.

Please cancel claims 57-59, 68, 71-75, 77 and 79-80 without prejudice of disclaimer.

Please amend the claims indicated below as follows:

56. (Once Amended) A method of diagnosing the extent of activation of the pain sensing neurological pathway in a patient comprising:

- i) determining the amount of a cholinesterase pain marker in a biological sample obtained from said patient;
 - ii) comparing the amount of the cholinesterase pain marker in said sample to a threshold amount of cholinesterase pain marker; and
 - iii) assigning a pain status to the patient based upon the comparison,
- wherein the threshold amount of cholinesterase pain marker is determined by measuring the amount of cholinesterase in samples from patients in whom the pain sensing neurological pathway is not activated and setting the threshold so that the threshold amount of cholinesterase pain marker is at least three standard deviations above the mean cholinesterase amount in samples from normal individuals.

60. (Once Amended) The method of claim 56, wherein additional amounts of cholinesterase pain marker are identified as indicative of increasing levels of pain sensing neurological pathway activation by comparing the mean amount of cholinesterase pain marker in individuals with higher levels of pain sensing neurological pathway activation with mean of cholinesterase pain marker in individuals with lower levels of pain sensing neurological pathway activation and selecting an amount between the two means.

61. (Previously Added) The method of claim 56, wherein the pain sensing neurological pathway is activated by chronic spinal pain.

62. (Previously Added) The method of claim 61, wherein the sample is blood or serum and the cholinesterase is serum cholinesterase.

63. (Previously Added) The method of claim 62, wherein threshold amount of cholinesterase pain marker is 1272 and patients from whom the sample contains less than this amount of serum cholinesterase are deemed to have normal activation levels of the pain sensing neurological pathway while patients from whom the sample contains greater than this amount of serum cholinesterase are deemed to have high or activated activation levels of the pain sensing neurological pathway.

64. (Previously Added) The method of claim 56 further including the step of separating components within the biological sample.

65. (Previously Added) The method of claim 64 wherein separating comprises an electrophoretic separation.

66. (Once Amended) The method of claim 56, wherein the cholinesterase in the biological sample is reacted with a substrate to produce a detectable product.

67. (Once Amended) The method of claim 56, wherein the threshold amount of cholinesterase pain marker is based upon a normal individual sample obtained from the same patient prior to activation of the pain sensing neurological pathway.

69. (Previously Added) The method of claim 56, wherein the activation of the pain sensing neurological pathway is caused by the presence of a lesion.

70. (Once Amended) The method of claim 56, whereby cholinesterase is distinguished and measured by eserine sensitivity.

76. (Once Amended) A diagnostic kit for determining the level of activation of the pain sensing neurological pathway in a patient comprising at least one antibody that binds to cholinesterase in a biological sample obtained from the patient wherein the amount of cholinesterase in the sample is then compared with an amount of cholinesterase known to be indicative of activation of the pain sensing neurological pathway.

78. (Once Amended) The diagnostic kit of claim 76, wherein the antibody or antibodies are polyclonal antibodies, monoclonal antibodies or fragments of polyclonal or monoclonal antibodies.

81. (Previously Added) The method of claim 76 wherein cholinesterase is distinguished and measured based upon eserine sensitivity.

Please add new claims 82-85 as follows:

82.(New) A method of diagnosing the extent of activation of the pain sensing neurological pathway in a patient comprising:

- i) determining the amount of a pain marker in a biological sample obtained from said patient;
- ii) comparing the amount of the pain marker in said sample to at least one pre-determined pain marker amount;
- iii) assigning a pain status to the patient based upon the comparison.

83.(New) A method for determining the efficacy of a treatment for pain comprising:

- i) determining the amount of a pain marker in a first biological sample obtained from said patient;
- ii) administering the treatment to said patient;
- iii) determining the amount of a pain marker in a second biological sample obtained from said treated patient; and
- iv) comparing the amount of the pain marker in the first and second biological samples.

84.(New) A diagnostic kit for determining the level of activation of the pain sensing neurological pathway in a patient comprising at least one agent that reacts with cholinesterase in a biological sample obtained from a patient wherein the amount of cholinesterase in the sample is then compared with an amount of cholinesterase known to be indicative of activation of the pain sensing neurological pathway.

85.(New) A method of diagnosing the extent of activation of the pain sensing

neurological pathway in a patient comprising:

- i) determining the amounts of at least two pain markers in a biological sample obtained from said patient;
- ii) comparing the amounts of the at least two pain marker in said sample to a pre-determined amount of each pain marker
- iii) assigning a pain status to the patient based upon the comparison.